WE CLAIM:

1. A method of producing a polygonal, ring-shaped machine part having a complex cross-section from a metal rod, comprising the steps of:

A_1) forging the rod material to prepare a long notched blank **1** having large diameter parts **11**, the number of which corresponds to the number of the parts to be bent, and the remaining small diameter parts **12**;

B_1) bending the large diameter parts **11** of the above long blank **1** to form a first intermediate **3** of polygonal, open ring-shape with confronting ends;

C_1) butting and welding the confronting ends of the above ring-shaped first intermediate **3** to form a polygonal, closed ring-shaped second intermediate **5**;

D_1) die-forging the above closed ring-shaped second intermediate **5** to form a polygonal, ring-shaped product **7** having a complex cross-section; and

E_1) subjecting the above polygonal, ring-shaped product **7** to necessary finishing step such as machining to obtain a polygonal, ring-shaped machine part **8** having a complex cross-section.

2. A method of producing a polygonal, ring-shaped machine part having a complex cross-section from a metal rod, comprising the steps of:

A_2) forging the rod material to prepare two short notched blanks **2** having large diameter parts **21**, the number of which corresponds to half of the parts to be bent, and the remaining small diameter parts

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B_2) bending the large diameter parts **21** of the above short blanks **2** to form an intermediate **4** of square U-shape, which is a half of the final product;

C_2) butting the ends of the above two square U-shaped intermediates **4** and welding the confronting ends to form a polygonal, closed ring-shaped second intermediate **6**;

D_2) die-forging the above closed ring-shaped second intermediate **6** to form a polygonal, ring-shaped product **7** having a complex cross-section; and

E_2) subjecting the above polygonal, ring-shaped product **7** to necessary finishing step or steps such as machining to obtain a polygonal, ring-shaped part **8** having a complex cross-section.

3. The method of producing according to claim 1 or claim 2, wherein the long notched blank **1** or the short notched blank **2** is prepared by using a rotary forging machine.

4. The method of producing according to claim 1 or claim 2, wherein the welding is carried out by flash butt welding.

5. A polygonal, ring-shaped machine part having a complex cross-section, which is a frame for transition piece of a gas turbine produced by the method according to claim 1 or claim 2.